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MORBIDITY AND MORTALITY WEEKLY REPORT

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Topics in Minority Health

Motor Vehicle Crashes and Injuries in an Indian Community — Arizona

In 1985 and 1986, the Whiteriver Service Unit of the Indian Health Service (IHS) investigated motor vehicle (MV) crashes* on the White Mountain Apache Reservation in eastern Arizona (Figure 1). The reservation is located on 2600 square miles in a rural area with varied topography and climate. In 1986, the population of the White Mountain Apaches was 9302 (3.6 persons per square mile, compared with the 1980 U.S. average of 64.4 persons per square mile). More than 3900 tribal members reside in the community of Whiteriver, approximately 180 miles northeast of Phoenix. To determine the incidence of injuries attributable to MV crashes and to identify risk factors amenable to prevention strategies, the investigators reviewed White Mountain Apache Tribal Police Department crash reports, Arizona Department of Transportation (ADOT) data, and emergency department records at the Whiteriver IHS Hospital.

*A crash or collision involving an MV in motion, excluding events in public parking areas.

FIGURE 1. Whiteriver Service Unit of the Indian Health Service — Arizona

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES / PUBLIC HEALTH SERVICE

Motor Vehicle Crashes — Continued

For the 2-year period, 571 MV crashes were identified. Serious injury or death occurred in 120 (21%) crashes, resulting in 128 hospitalizations and 24 fatalities. The total annual MV-related fatality rate was 129 deaths per 100,000 population; the rate was four times higher for males (206 per 100,000) than for females (53 per 100,000).

Two priority injury events were identified that were readily amenable to prevention: 1) crashes involving pedestrians and 2) collisions with animals. Pedestrians were involved in only 30 (5%) crashes, but accounted for seven (29%) fatalities and 17 (13%) hospitalizations. Ten crashes involving pedestrians occurred along a 1-mile stretch of highway with heavy pedestrian traffic in the Whiteriver community. Although posted with a 25-mile-per-hour speed limit, this section of road had inadequate lighting. Eighty (14%) crashes involved animals; 63 of these involved domestic livestock. Nineteen human injuries, but no fatalities, resulted from collisions with animals. Most (63%) pedestrian injuries and most (77%) collisions involving animals occurred at night. The 461 (81%) MV crashes not involving pedestrians or animals accounted for 17 fatalities and 104 hospitalizations.

In addition, although most (73%) of the crashes occurred on state highways, ADOT had records for only 58% of crashes recorded by tribal police. Of 185 crashes that occurred on one state highway, ADOT received reports on 57 (30%). A third of all severe injuries and fatalities occurred along this highway.

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Editorial Note: In 1985, the crude annual MV-related fatality rate for the White Mountain Apaches (129 per 100,000) was three times higher than that for all American Indians and Alaskan Natives (43 per 100,000) and nearly seven times higher than that for the total U.S. population (19 per 100,000) (*1*). Although American Indians and Alaskan Natives are younger than the overall U.S. population, and MV-related fatalities occur disproportionately among the young, age-adjusted fatality rates for American Indians and Alaskan Natives for 1981–1985 have been >2 times the rate for all U.S. residents and other minority groups (*1*; IHS, unpublished data).

Because MV fatality rates correlate inversely with population density in the United States, the tribe's rural location may account in part for the elevated MV-related death rate. Some researchers have attributed higher MV fatality rates in the rural western United States to greater driving distances in those states, although one study found rural MV death rates to be elevated even when the data were adjusted for distance traveled (*2*). Other factors that may contribute to the elevated risk in rural areas include greater distances between emergency facilities, reduced access to major trauma centers, travel at higher speeds, and poor roads in rural areas where traffic volume is low. In this study, reliable data were not available to assess the contribution of alcohol and the use/nonuse of occupant-protection devices.

This investigation provided baseline information used to develop local prevention measures. Intervention strategies developed in the community focused on MV-related injury events identified as priorities. Because inadequate lighting was identified as contributing to many pedestrian injuries, the tribe, IHS, and ADOT provided funding for street lights, which were installed in December 1988 along the route

Motor Vehicle Crashes — Continued

where pedestrians were most frequently injured. To reduce the number of crashes involving domestic animals, the White Mountain Apache Tribe is developing legislation to remove domestic livestock from roadways, require penning of animals, and fine the owners of stray livestock.

ADOT allocates funds for road maintenance and highway safety improvement based on the frequency of MV crashes on state roads. Because MV crashes on the Whiteriver reservation were underreported to ADOT, fewer state resources had been allocated to make necessary environmental modifications. However, ADOT administrators and design engineers are using data from this investigation to review the priority status of planned Whiteriver highway improvements. In 1990, some two-lane roads are scheduled for expansion to four lanes, and traffic lights in high-risk areas are to be relocated to facilitate safer pedestrian crossings. To more accurately document MV injuries on the reservation and to evaluate highway safety interventions, the White Mountain Apache Tribal Police Department has developed an improved system of reporting MV crashes to ADOT.

The Whiteriver investigation has been used as a model for MV-related injury prevention in the IHS Injury Prevention Program (*3*). Begun in 1987, this community-action program trains selected IHS employees and tribal representatives in injury surveillance, epidemiology, and intervention strategies. Thirty graduates of the 1-year program are promoting injury prevention in American Indian and Alaskan Native communities.

References

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Epidemiologic Notes and Reports

Measles Outbreak — Chicago, 1989

As of August 23, 1989, 1123 confirmed cases of measles have been reported to the Chicago Department of Health. Information is available for 1019 (91%) of these cases; 799 (78%) have occurred in preschool-aged children (<5 years old), including 340 (33%) children <16 months of age (i.e., too young for routine immunization). Blacks and Hispanics have accounted for 955 (94%) of the cases. Four measles-associated fatalities have been reported.

Outbreak-control activities have included intensified surveillance and lowering of the recommended age for measles vaccination to 6 months during the outbreak, with revaccination at age 15 months for children vaccinated before the first birthday. Single-antigen measles vaccine is being used for children before the first birthday, and measles-mumps-rubella vaccine (MMR) is administered to older children. Seven new vaccination clinics have been established and have administered approximately 21,000 doses of vaccine; door-to-door vaccination teams in high-risk communities have administered an additional 2000 doses of vaccine. Hospital emergency department vaccination clinics have been set up in four locations.

Measles — Continued

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Editorial Note: This outbreak is similar to others among inner-city populations in the United States in that it involves primarily unvaccinated black and Hispanic preschool-aged children (*1–3*). The Chicago Department of Health has implemented aggressive outbreak strategies directed toward reaching the highest-risk group, i.e., unvaccinated preschool-aged children. Such children are also likely to be a reservoir for transmitting virus to other age groups. As part of the extensive outbreak-control efforts, children are being vaccinated in emergency departments. Provision of vaccine to inner-city children who use these facilities for their primary source of health care should help to increase vaccination levels in patients who receive sporadic health care and may reduce the transmission of measles in emergency department settings.

References

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TABLE I. Summary — cases of specified notifiable diseases, United States

Disease	34th Week Ending			Cumulative, 34th Week Ending		
	Aug. 26, 1989	Aug. 27, 1988	Median 1984-1988	Aug. 26, 1989	Aug. 27, 1988	Median 1984-1988
Acquired Immunodeficiency Syndrome (AIDS)	965	U*	170	22,431	20,707	8,218
Aseptic meningitis	294	224	400	4,413	3,571	4,641
Encephalitis: Primary (arthropod-borne & unspec)	25	21	40	452	516	656
Post-infectious	2	2	2	64	85	81
Gonorrhea: Civilian	11,273	14,569	18,254	423,338	446,351	533,797
Military	249	224	431	6,925	8,009	11,092
Hepatitis: Type A	563	546	431	22,067	16,148	14,233
Type B	445	458	519	14,733	14,619	16,484
Non A, Non B	37	54	72	1,552	1,729	2,384
Unspecified	48	64	80	1,527	1,405	2,969
Legionellosis	34	13	13	631	631	464
Leprosy	4	6	6	103	114	146
Malaria	22	27	24	755	573	595
Measles: Total†	50	55	32	9,650	2,151	2,332
Indigenous	34	50	27	9,216	1,928	1,961
Imported	16	5	4	434	223	258
Meningococcal infections	43	29	29	1,897	2,065	1,969
Mumps	53	55	55	3,902	3,402	3,303
Pertussis	151	98	101	1,915	1,679	1,672
Rubella (German measles)	-	7	6	287	151	408
Syphilis (Primary & Secondary): Civilian	656	841	582	25,974	26,710	18,088
Military	3	2	2	157	111	118
Toxic Shock syndrome	5	6	6	239	230	239
Tuberculosis	421	472	472	13,595	13,549	13,745
Tularemia	6	3	7	105	133	133
Typhoid Fever	13	9	6	311	227	215
Typhus fever, tick-borne (RMSF)	13	26	25	383	420	451
Rabies, animal	61	101	118	3,093	2,797	3,455

TABLE II. Notifiable diseases of low frequency, United States

	Cum. 1989		Cum. 1989
Anthrax	-	Leptospirosis (Mass. 1)	65
Botulism: Foodborne	15	Plague	3
Infant (Calif. 1)	9	Poliomyelitis, Paralytic	-
Other	4	Psittacosis (Ore. 1)	65
Brucellosis (Pa. 1)	56	Rabies, human	1
Cholera	-	Tetanus	31
Congenital rubella syndrome	1	Trichinosis	13
Congenital syphilis, ages < 1 year	82		
Diphtheria	2		

*Because AIDS cases are not received weekly from all reporting areas, comparison of weekly figures may be misleading.
†Nine of the 50 reported cases for this week were imported from a foreign country or can be directly traceable to a known internationally imported case within two generations.

TABLE III. Cases of specified notifiable diseases, United States, weeks ending August 26, 1989 and August 27, 1988 (34th Week)

Reporting Area	AIDS	Aseptic Meningitis	Encephalitis		Gonorrhea (Civilian)		Hepatitis (Viral), by type				Legionellosis	Leprosy
			Primary	Post-infectious			A	B	NA,NB	Unspecified		
	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1988	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1989
UNITED STATES	22,431	4,413	452	64	423,338	446,351	22,067	14,733	1,552	1,527	631	103
NEW ENGLAND	956	246	17	2	12,809	13,714	473	724	52	58	41	6
Maine	41	12	5	-	177	263	13	38	5	1	5	-
N.H.	31	22	-	-	115	173	45	45	8	4	1	-
Vt.	9	19	2	-	44	86	26	57	5	-	-	-
Mass.	519	86	5	2	4,968	4,713	139	429	23	43	27	4
R.I.	55	44	-	-	939	1,161	27	45	3	3	8	1
Conn.	301	63	5	-	6,566	7,318	223	110	8	7	-	1
MID. ATLANTIC	6,453	392	50	5	83,097	71,328	2,526	2,211	143	193	160	14
Upstate N.Y.	883	189	17	4	10,011	8,762	564	419	55	6	51	3
N.Y. City	3,340	83	2	1	22,797	32,551	289	833	28	163	22	9
N.J.	1,482	-	31	-	9,781	9,910	272	407	18	5	29	1
Pa.	738	120	-	-	10,508	20,105	1,421	552	42	19	58	1
E.N. CENTRAL	1,713	724	150	6	78,833	72,875	1,270	1,811	178	62	167	3
Ohio	287	170	50	2	20,165	16,317	273	344	30	14	80	-
Ind.	251	122	27	3	5,638	5,613	143	283	21	23	32	1
Ill.	769	131	29	1	26,124	20,938	560	478	67	15	14	2
Mich.	326	267	33	-	20,796	23,577	189	435	38	10	28	-
Wis.	80	34	11	-	6,110	6,430	105	261	22	-	13	-
W.N. CENTRAL	540	206	20	3	19,776	18,547	790	648	68	19	27	1
Minn.	118	7	-	1	2,178	2,508	83	75	14	3	2	-
Iowa	38	31	6	-	1,653	1,350	58	24	11	3	5	-
Mo.	264	97	2	-	12,023	10,596	441	458	24	8	11	-
N. Dak.	6	9	1	-	83	117	4	17	3	1	1	-
S. Dak.	4	6	3	-	168	348	10	7	5	-	1	-
Nebr.	16	6	4	-	890	1,056	60	17	-	2	2	1
Kans.	94	52	4	2	2,781	2,570	134	50	11	2	5	-
S. ATLANTIC	4,820	899	79	26	121,105	126,507	2,062	2,854	238	226	81	1
Del.	61	37	1	-	2,005	1,910	28	99	5	5	7	-
Md.	475	117	14	2	13,661	13,286	545	499	20	25	20	-
D.C.	360	8	-	-	8,117	9,252	4	19	2	-	-	-
Va.	328	167	30	3	9,990	8,982	209	209	53	125	6	-
W. Va.	32	23	25	-	926	884	14	69	9	3	-	-
N.C.	352	92	4	1	18,374	17,982	296	706	61	-	22	1
S.C.	215	26	-	-	11,019	9,660	46	398	3	9	4	-
Ga.	757	76	1	-	23,272	24,250	231	276	9	8	13	-
Fla.	2,240	353	4	20	33,741	40,301	689	579	76	51	9	-
E.S. CENTRAL	482	397	18	2	35,257	34,972	253	1,044	105	4	32	-
Ky.	75	121	6	1	3,376	3,487	78	281	34	3	8	-
Tenn.	156	62	-	-	11,813	11,726	97	556	22	-	15	-
Ala.	144	150	12	-	11,194	10,894	54	145	45	1	9	-
Miss.	107	64	-	1	8,874	8,865	24	62	4	-	-	-
W.S. CENTRAL	1,953	567	44	3	46,784	49,742	2,454	1,432	104	355	33	16
Ark.	57	17	5	-	5,465	4,820	166	51	10	6	1	-
La.	339	49	10	-	9,905	9,867	187	245	11	1	4	-
Okla.	101	48	11	1	4,067	4,591	273	140	23	22	19	-
Tex.	1,457	453	18	2	27,347	30,464	1,828	996	60	326	9	16
MOUNTAIN	665	177	7	2	9,486	9,771	3,350	977	153	110	36	2
Mont.	10	5	-	-	129	311	45	36	6	2	2	1
Idaho	16	1	-	1	124	250	116	86	11	3	-	-
Wyo.	13	3	-	-	62	136	34	4	2	-	-	-
Colo.	224	83	1	1	2,090	2,181	372	121	41	48	3	-
N. Mex.	52	8	1	-	901	923	420	140	28	2	2	-
Ariz.	176	55	2	-	3,592	3,504	1,736	362	35	48	18	1
Utah	42	14	1	-	293	374	356	78	20	4	7	-
Nev.	132	8	2	-	2,295	2,092	271	150	10	5	4	-
PACIFIC	4,849	803	67	15	46,191	48,895	8,889	3,032	511	500	54	60
Wash.	403	-	2	1	4,228	4,605	2,079	668	144	36	18	6
Oreg.	154	-	-	-	2,032	2,114	1,577	330	53	9	1	1
Calif.	4,169	740	56	13	38,938	41,072	4,592	1,932	302	441	32	49
Alaska	11	11	7	-	664	680	500	42	5	4	1	-
Hawaii	112	52	2	1	329	424	141	60	7	10	2	4
Guam	1	-	-	-	-	97	-	-	-	-	-	-
P.R.	885	64	2	1	703	900	130	162	16	18	-	8
V.I.	26	-	-	-	454	288	-	5	-	-	-	-
Amer. Samoa	-	-	-	-	-	65	-	-	-	-	-	-
C.N.M.I.	-	-	-	-	-	34	-	-	-	-	-	-

N: Not notifiable U: Unavailable C.N.M.I.: Commonwealth of the Northern Mariana Islands

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending August 26, 1989 and August 27, 1988 (34th Week)

Reporting Area	Malaria	Measles (Rubeola)					Menin-gococcal infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported*		Total									
	Cum. 1988	1989	Cum. 1989	1989	Cum. 1989	Cum. 1988	Cum. 1989	1989	Cum. 1989	1989	Cum. 1989	Cum. 1988	1989	Cum. 1989	Cum. 1988
UNITED STATES	755	34	9,216	16	434	2,151	1,897	53	3,902	151	1,915	1,679	-	287	151
NEW ENGLAND	43	1	280	2	28	107	139	1	68	11	259	199	-	6	5
Maine	-	-	-	-	-	7	13	-	-	3	9	11	-	-	-
N.H.	2	-	8	25	3	87	15	1	13	-	5	33	-	4	3
Vt.	2	-	1	-	1	-	6	-	1	-	8	3	-	1	-
Mass.	23	1	28	-	17	3	73	-	47	7	215	127	-	1	1
R.I.	6	-	38	-	3	-	1	-	-	-	11	9	-	-	1
Conn.	8	-	205	-	4	10	31	-	7	1	13	16	-	-	-
MID. ATLANTIC	129	6	603	-	168	847	263	5	363	-	106	100	-	23	12
Upstate N.Y.	22	-	42	-	96	32	90	2	133	-	43	61	-	10	2
N.Y. City	47	-	68	-	14	43	33	-	19	-	3	2	-	13	7
N.J.	30	-	294	-	-	241	54	-	160	-	21	4	-	-	1
Pa.	30	6	199	-	58	531	86	3	52	-	39	33	-	-	2
E.N. CENTRAL	61	8	2,154	-	64	179	236	-	430	4	189	189	-	22	24
Ohio	9	-	706	-	35	24	89	-	118	-	45	25	-	3	1
Ind.	8	-	76	-	-	57	26	-	40	-	18	57	-	-	-
Ill.	26	-	907	-	-	71	64	-	135	-	71	32	-	17	19
Mich.	11	8	293	-	14	23	44	-	106	4	30	28	-	1	4
Wis.	7	-	168	-	15	4	13	-	31	-	25	47	-	1	-
W.N. CENTRAL	24	2	562	-	4	13	69	-	363	1	85	97	-	6	-
Minn.	8	-	15	-	-	11	12	-	1	-	18	41	-	-	-
Iowa	2	2	8	-	1	-	2	-	29	-	13	19	-	1	-
Mo.	8	-	299	-	-	2	22	-	52	-	46	15	-	4	-
N. Dak.	1	-	-	-	-	-	-	-	-	-	-	11	-	-	-
S. Dak.	1	-	-	-	-	-	7	-	-	-	1	5	-	-	-
Nebr.	1	-	108	-	2	-	15	-	5	1	4	-	-	-	-
Kans.	3	-	132	-	1	-	11	-	276	-	3	6	-	1	-
S. ATLANTIC	136	8	505	11	47	310	324	9	669	32	191	171	-	8	16
Del.	3	-	65	-	1	-	2	-	1	-	1	7	-	-	-
Md.	24	6	46	10¶	31	14	57	5	352	10	26	26	-	2	1
D.C.	9	-	24	-	3	-	15	-	111	-	-	1	-	-	-
Va.	24	-	19	-	3	143	36	2	96	15	24	19	-	-	11
W. Va.	2	-	51	-	-	6	12	-	10	-	20	7	-	-	-
N.C.	17	-	168	-	-	4	44	-	27	-	40	46	-	1	-
S.C.	5	1	3	-	-	-	21	-	19	-	-	1	-	-	-
Ga.	9	-	1	1	-	-	57	1	15	5	26	30	-	-	1
Fla.	44	1	129	1†	8	143	80	1	28	2	54	34	-	5	3
E.S. CENTRAL	8	1	198	1	2	69	59	3	195	6	84	60	-	2	2
Ky.	-	-	30	1§	2	35	35	-	9	-	1	12	-	-	-
Tenn.	1	-	120	-	-	-	4	2	65	4	31	17	-	2	2
Ala.	5	1	48	-	-	-	17	1	17	2	50	27	-	-	-
Miss.	2	-	-	-	-	34	3	N	N	-	2	4	-	-	-
W.S. CENTRAL	41	1	3,085	-	42	14	128	31	1,254	59	219	93	-	36	6
Ariz.	-	-	-	-	5	1	8	-	124	1	18	11	-	-	2
La.	2	-	9	-	-	-	34	22	520	2	13	16	-	5	-
Okla.	5	1	122	-	-	8	19	5	180	16	41	39	-	1	1
Tex.	34	-	2,954	-	37	5	67	4	424	40	147	27	-	30	3
MOUNTAIN	17	7	348	2	28	138	59	2	149	18	479	456	-	34	6
Mont.	1	-	12	-	1	23	1	-	2	3	29	1	-	1	-
Idaho	2	-	-	-	2	1	2	-	14	1	57	281	-	31	-
Wyo.	1	-	-	-	-	-	-	-	7	-	-	1	-	1	-
Colo.	2	-	64	15	6	114	19	-	22	-	32	14	-	-	2
N. Mex.	1	-	16	-	15	-	1	N	N	1	20	29	-	-	-
Ariz.	7	7	137	-	-	-	24	2	91	13	326	127	-	-	-
Utah	-	-	118	-	-	-	5	-	8	-	14	22	-	-	3
Nev.	3	-	1	1†	2	-	7	-	5	-	1	1	-	1	1
PACIFIC	296	-	1,483	-	53	474	620	2	421	20	303	314	-	150	80
Wash.	24	-	20	-	12	2	65	-	38	9	120	71	-	-	-
Oreg.	18	-	9	-	19	3	43	N	N	-	7	20	-	2	-
Calif.	244	-	1,436	-	14	457	506	-	370	8	168	186	-	125	54
Alaska	4	-	-	-	-	-	4	-	2	-	-	7	-	-	-
Hawaii	6	-	18	-	8	12	2	2	13	3	8	50	-	23	26
Guam	-	U	-	U	-	1	-	U	-	U	-	-	U	-	1
P.R.	1	7	443	-	-	190	4	-	8	-	4	12	-	7	2
V.I.	-	-	4	-	-	-	-	1	13	-	-	-	-	-	-
Amer. Samoa	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-
C.N.M.I.	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-

*For measles only, imported cases includes both out-of-state and international importations.
N: Not notifiable U: Unavailable †International §Out-of-state

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending August 26, 1989 and August 27, 1988 (34th Week)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1989	Cum. 1988	Cum. 1989	Cum. 1989	Cum. 1988	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1989
UNITED STATES	25,974	26,710	239	13,595	13,549	105	311	383	3,093
NEW ENGLAND	1,101	718	12	363	329	2	25	6	7
Maine	8	11	3	12	17	-	-	-	2
N.H.	16	6	1	17	7	-	-	-	1
Vt.	-	3	-	7	2	-	-	-	-
Mass.	337	278	4	183	184	2	15	3	2
R.I.	21	22	1	42	31	-	5	1	-
Conn.	725	398	3	102	88	-	5	2	2
MID. ATLANTIC	4,653	6,826	36	2,639	2,652	2	94	48	491
Upstate N.Y.	584	337	6	211	344	1	24	11	41
N.Y. City	2,415	5,000	2	1,443	1,415	-	47	3	-
N.J.	882	601	10	527	464	-	17	19	-
Pa.	792	888	18	458	429	1	6	15	450
E.N. CENTRAL	1,188	731	36	1,468	1,468	3	33	52	73
Ohio	88	68	12	257	277	-	7	27	6
Ind.	43	36	5	114	149	1	2	18	2
Ill.	519	361	6	667	638	-	18	5	18
Mich.	380	238	13	345	334	1	4	2	7
Wis.	158	38	-	85	70	1	2	-	40
W.N. CENTRAL	214	149	28	356	357	41	5	59	408
Minn.	32	16	7	70	58	-	1	-	86
Iowa	22	16	4	28	35	-	2	1	110
Mo.	112	88	6	168	179	30	1	48	31
N. Dak.	2	2	-	11	11	-	-	1	42
S. Dak.	1	-	3	18	25	6	-	1	66
Nebr.	17	21	5	16	9	1	-	-	37
Kans.	28	6	3	45	40	4	1	8	36
S. ATLANTIC	9,582	9,194	21	2,913	2,933	6	28	108	942
Del.	110	74	1	25	24	-	2	1	24
Md.	509	509	1	234	285	2	7	9	268
D.C.	608	445	1	132	131	-	2	-	2
Va.	347	267	4	232	266	4	4	6	180
W. Va.	11	34	-	52	52	-	-	2	41
N.C.	673	518	6	351	287	-	2	53	5
S.C.	560	463	3	338	323	-	2	22	148
Ga.	1,955	1,525	3	458	483	-	3	13	162
Fla.	4,819	5,359	2	1,091	1,082	-	6	2	112
E.S. CENTRAL	1,854	1,303	4	1,101	1,134	6	2	38	248
Ky.	38	43	1	267	281	1	1	11	107
Tenn.	624	583	2	321	326	4	-	23	55
Ala.	565	376	1	320	348	-	1	2	85
Miss.	427	301	-	193	201	1	-	2	1
W.S. CENTRAL	3,767	2,786	22	1,614	1,671	31	13	49	441
Ark.	242	160	1	165	184	22	-	12	60
La.	985	537	-	212	190	-	1	-	5
Okla.	63	104	12	145	161	9	1	32	74
Tex.	2,577	1,985	9	1,092	1,136	-	11	5	302
MOUNTAIN	487	530	36	293	390	9	6	20	170
Mont.	1	3	-	11	12	1	-	14	59
Idaho	1	2	3	21	13	-	-	2	4
Wyo.	3	1	2	-	2	1	-	1	52
Colo.	55	76	5	12	66	2	2	3	16
N. Mex.	21	39	6	53	71	2	-	-	16
Ariz.	162	109	9	140	170	-	3	-	19
Utah	12	11	9	26	18	2	1	-	2
Nev.	232	289	3	30	38	1	-	-	2
PACIFIC	3,118	4,473	44	2,848	2,615	5	105	3	313
Wash.	252	150	2	160	137	-	6	-	-
Oreg.	161	191	-	94	99	3	5	1	-
Calif.	2,692	4,099	41	2,445	2,251	2	88	2	250
Alaska	4	9	-	33	26	-	-	-	63
Hawaii	9	24	1	116	102	-	6	-	-
Guam	-	3	-	-	17	-	-	-	-
P.R.	376	413	-	200	149	-	1	-	45
V.I.	8	1	-	4	5	-	-	-	-
Amer. Samoa	-	-	-	-	3	-	-	-	-
C.N.M.I.	-	1	-	-	17	-	-	-	-

U: Unavailable

TABLE IV. Deaths in 121 U.S. cities,* week ending August 26, 1989 (34th Week)

Reporting Area	All Causes, By Age (Years)						P&I**
	All Ages	>65	45-64	25-44	1-24	<1	Total
NEW ENGLAND	580	398	106	49	23	13	49
Boston, Mass.	170	111	29	17	6	7	26
Bridgeport, Conn.	35	29	6	-	-	-	1
Cambridge, Mass.	20	18	1	1	-	-	4
Fall River, Mass.	21	17	3	-	1	-	-
Hartford, Conn.	60	33	13	8	2	4	2
Lowell, Mass.	33	26	3	2	2	-	-
Lynn, Mass.	17	14	2	1	-	-	1
New Bedford, Mass.	25	21	3	1	-	-	-
New Haven, Conn.	39	13	17	4	3	2	5
Providence, R.I.	33	23	6	3	1	-	-
Somerville, Mass.	6	4	-	1	1	-	-
Springfield, Mass.	48	35	5	6	2	-	4
Waterbury, Conn.	20	11	6	3	-	-	4
Worcester, Mass.	62	43	12	2	5	-	2
MID. ATLANTIC	2,380	1,473	472	289	73	73	124
Albany, N.Y.	49	34	9	4	-	2	1
Allentown, Pa.	25	19	5	1	-	-	1
Buffalo, N.Y.	95	64	20	7	2	2	6
Camden, N.J.	24	17	3	1	1	2	-
Elizabeth, N.J.	39	34	3	2	-	-	-
Erie, Pa.†	40	25	10	2	2	1	1
Jersey City, N.J.	46	30	5	5	-	6	2
N.Y. City, N.Y.	1,370	822	269	196	43	40	59
Newark, N.J.	52	20	14	13	2	3	4
Paterson, N.J.	25	15	5	3	1	1	1
Philadelphia, Pa.	224	121	55	30	10	8	23
Pittsburgh, Pa.†	68	43	16	5	3	1	6
Reading, Pa.	32	24	7	-	-	1	2
Rochester, N.Y.	110	77	24	6	2	1	8
Schenectady, N.Y.	22	19	2	-	1	-	-
Scranton, Pa.†	26	16	6	2	-	-	1
Syracuse, N.Y.	59	41	8	4	4	2	2
Trenton, N.J.	26	17	6	1	1	1	1
Utica, N.Y.	21	15	2	3	1	-	3
Yonkers, N.Y.	27	18	3	4	-	2	3
E.N. CENTRAL	2,205	1,426	477	168	56	78	86
Akron, Ohio	64	46	11	4	1	2	5
Canton, Ohio	29	20	5	1	3	-	3
Chicago, Ill.§	564	362	125	45	10	22	16
Cincinnati, Ohio	149	94	35	11	2	7	8
Cleveland, Ohio	128	83	26	13	2	4	3
Columbus, Ohio	151	98	24	11	8	10	-
Dayton, Ohio	115	85	22	4	3	1	6
Detroit, Mich.	234	120	59	36	9	10	3
Evansville, Ind.	35	23	7	3	1	1	7
Fort Wayne, Ind.	62	45	10	4	2	1	3
Gary, Ind.	14	6	5	3	-	-	-
Grand Rapids, Mich.	62	46	11	2	2	1	4
Indianapolis, Ind.	186	103	32	10	7	4	6
Madison, Wis.	41	23	12	3	1	2	4
Milwaukee, Wis.	123	84	30	7	-	2	2
Peoria, Ill.	34	26	3	3	-	2	4
Rockford, Ill.	40	28	10	2	1	1	3
South Bend, Ind.	51	35	12	1	-	3	-
Toledo, Ohio	101	61	29	2	4	5	8
Youngstown, Ohio	52	40	9	3	-	-	1
W.N. CENTRAL	786	557	126	42	19	21	27
Des Moines, Iowa	63	47	11	2	-	3	3
Duluth, Minn.	19	11	5	-	1	1	-
Kansas City, Kans.§	65	50	10	4	1	-	2
Kansas City, Mo.	121	85	22	8	3	3	4
Lincoln, Nebr.	34	25	6	2	-	1	1
Minneapolis, Minn.	158	111	32	5	5	5	9
Omaha, Nebr.	77	56	13	5	2	1	3
St. Louis, Mo.	133	98	18	6	6	5	5
St. Paul, Minn.	57	47	4	5	1	-	-
Wichita, Kans.	39	27	5	5	-	2	-
S. ATLANTIC	1,127	659	245	140	43	39	42
Atlanta, Ga.	130	72	29	24	5	-	2
Baltimore, Md.	117	69	26	15	7	-	6
Charlotte, N.C.	95	55	22	11	3	4	8
Jacksonville, Fla.	114	67	27	14	2	4	7
Miami, Fla.	106	49	22	28	2	5	-
Norfolk, Va.	39	27	8	3	-	1	2
Richmond, Va.	65	54	18	7	6	-	4
Savannah, Ga.	37	20	7	5	3	2	3
St. Petersburg, Fla.	74	53	11	3	1	6	3
Tampa, Fla.	71	43	16	5	3	4	4
Washington, D.C.	233	131	53	24	11	13	3
Wilmington, Del.	26	19	6	1	-	-	-
E.S. CENTRAL	788	527	160	57	24	20	59
Birmingham, Ala.	92	58	16	7	5	6	2
Chattanooga, Tenn.	59	40	16	2	1	-	8
Knoxville, Tenn.	91	61	23	6	-	1	16
Louisville, Ky.	121	75	27	11	2	6	6
Memphis, Tenn.	196	137	34	17	8	-	17
Mobile, Ala.	78	54	15	3	4	2	-
Montgomery, Ala.	39	24	10	2	1	2	-
Nashville, Tenn.	112	78	19	9	3	3	10
W.S. CENTRAL	1,761	1,081	370	194	60	46	68
Austin, Tex.	55	30	15	8	2	-	3
Baton Rouge, La.	31	20	5	4	1	1	-
Corpus Christi, Tex.	55	37	13	5	-	-	1
Dallas, Tex.	187	96	42	26	13	10	5
El Paso, Tex.	70	49	10	6	3	2	5
Fort Worth, Tex	82	55	15	9	1	2	5
Houston, Tex.§	734	436	169	89	24	16	18
Little Rock, Ark.	83	55	13	8	3	4	-
New Orleans, La.	140	85	34	17	3	1	-
San Antonio, Tex.	192	130	33	15	8	6	15
Shreveport, La.	35	24	7	3	-	1	4
Tulsa, Okla.	97	74	14	4	2	3	12
MOUNTAIN	646	412	120	61	33	20	32
Albuquerque, N. Mex.	98	57	15	10	15	1	6
Colo. Springs, Colo.	48	30	11	4	2	1	4
Denver, Colo.	86	57	16	8	1	4	2
Las Vegas, Nev.	80	53	16	8	2	1	10
Ogden, Utah	20	14	4	1	1	-	2
Phoenix, Ariz.	151	99	25	12	6	9	1
Pueblo, Colo.	28	22	4	1	1	-	1
Salt Lake City, Utah	45	22	8	10	1	4	-
Tucson, Ariz.	90	58	21	7	4	-	6
PACIFIC	2,027	1,295	372	207	96	48	100
Berkeley, Calif.	12	9	1	1	-	1	1
Fresno, Calif.	86	62	12	2	5	5	7
Glendale, Calif.	26	18	3	3	1	1	1
Honolulu, Hawaii	89	62	18	8	1	-	10
Long Beach, Calif.	108	56	23	20	6	3	9
Los Angeles Calif.	689	421	126	79	45	11	19
Oakland, Calif.	54	35	10	2	6	1	3
Pasadena, Calif.	35	25	6	3	1	-	3
Portland, Oreg.	83	56	16	6	5	-	-
Sacramento, Calif.	142	92	30	14	4	1	13
San Diego, Calif.	149	96	30	14	5	4	10
San Francisco, Calif.	159	91	27	31	2	7	5
San Jose, Calif.	155	104	30	10	7	4	9
Seattle, Wash.	141	95	24	10	7	5	4
Spokane, Wash.	47	37	7	3	-	-	5
Tacoma, Wash.	52	36	9	1	1	5	1
TOTAL	12,288††	7,838	2,448	1,207	427	358	587

*Mortality data in this table are voluntarily reported from 121 cities in the United States, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.

**Pneumonia and influenza.

†Because of changes in reporting methods in these 3 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

††Total includes unknown ages.

§Data not available. Figures are estimates based on average of past available 4 weeks.

Current Trends

National Mortality Followback Survey: Characteristics of Persons Who Died from Diseases of the Heart — United States, 1986

The National Mortality Followback Survey (NMFS) is a periodic survey conducted by CDC's National Center for Health Statistics and is designed to collect detailed information not otherwise available on a sample of decedents. This report describes the health and financial status of persons who died from heart disease in 1986 and illustrates the usefulness of the NMFS in addressing public health issues such as the financial burden of chronic disease.

The 1986 NMFS is a stratified random sample of 18,733 (approximately 1%) deaths from all causes among U.S. residents ≥25 years of age (*1*). Of these, 6665 were reported as dying from heart disease. Next of kin or others familiar with the decedent's lifestyle were asked to provide information concerning use of medical and other care facilities in the last year of the decedent's life; sources of payment of medical care; impairments in daily activities; medical conditions; health practices and behaviors; social and economic characteristics; and the identity of all health facilities in which the decedent stayed during the last year of life.

Diseases of the heart (*International Classification of Diseases, Ninth Revision* 390–398, 402, 404–429) are the most common cause of death in the United States. In 1986, 765,490 deaths (36% of all deaths in the United States) were reported to have resulted from heart disease (*1*), compared with an estimated 759,431 deaths based on the above sample.

Financial Status

At death, based on estimates from the NMFS, 67,650 (18%) men and 13,240 (5%) women who died from heart disease were employed (Table 1). In the last year of life, women were more likely than men to have had low family income: 53% of women with <$9000 compared with 35% of men, and 16% of women with ≥$25,000 compared with 21% of men.

Reported family income reflects the combined resources of all members of the family unit. Therefore, decedent living arrangements had a direct bearing on family income. Thirty-two percent of women who died from heart disease reportedly lived alone or with unrelated persons in the last year of life. An additional 22% had lived in a nursing home, other health-care facility, or institution during this time. By contrast, <20% of men lived alone or with unrelated persons, and 8% lived in institutional settings before death.

One measure of decedents' financial status was the total value of their assets (e.g., home, cash, stocks, bonds, cars, jewelry, and business interests) at death. Women were more likely to have had assets <$5000; 23% of women had no assets (Table 1). Women (24%) were less likely than men (35%) to have had assets ≥$50,000 at death.

Health Status

In addition to heart disease, many decedents had other serious health problems, including high blood pressure, stroke, angina pectoris, diabetes, cancer, asthma, and other lung conditions (Table 2). Except for angina pectoris and other lung conditions, women were more likely to have had these health problems.

More women (45%) than men (27%) were reported to have received help from others or used special equipment in performing activities of daily living (e.g., walking,

Mortality Survey — Continued

eating, bathing, dressing, or using the toilet) (Table 2). Forty-five percent of women and 33% of men also received help with home medical care (e.g., taking medicines or pills, receiving injections, having bandages changed, and receiving nursing care).

Health-Care Use and Sources of Payment

The 1986 NMFS assessed whether the decedent had been an overnight patient in a health facility during the last year of life. A larger proportion of women than men used hospitals or nursing homes, other health-care facilities, and home hospice care.

Medicare was reported as the major health payment source for approximately half the decedents (Table 2). For women, the next most frequently reported payment source was self/family (14%) or private insurance/health maintenance organizations (HMOs) (14%). In comparison, 12% of men used their own or their family's funds and 23% used private insurance/HMOs. An estimated 42% of women and 46% of men spent <$500 for their medical care. Eighteen percent of women and 11% of men spent ≥$5000 of their own money.

Reported by: Office of Vital and Health Statistics Systems, National Center for Health Statistics, CDC.

Editorial Note: Mortality followback surveys collect information not typically available from death certificates and therefore enable investigators to learn more about the characteristics of decedents and the circumstances of their death. The 1986 NMFS

TABLE 1. Selected socioeconomic characteristics of persons who died from diseases of the heart, by sex — United States,* 1986

Characteristic	Men No.†	Men (%)	Women No.†	Women (%)	Total§
Employment status					
Total	367,877	(100.0)	268,976	(100.0)	636,853
Employed	67,650	(18.4)	13,240	(5.0)	80,890
Not employed	300,227	(81.6)	255,736	(95.0)	555,963
Family income					
Total	305,661	(100.0)	280,536	(100.0)	586,197
<$5,000	44,578	(14.6)	82,599	(29.4)	127,177
$5,000–$8,999	63,478	(20.8)	67,018	(23.9)	130,496
$9,000–$24,999	134,567	(44.0)	87,507	(31.2)	222,076
≥$25,000	63,038	(20.6)	43,410	(15.5)	106,448
Living arrangements					
Total	379,413	(100.0)	348,075	(100.0)	727,488
Institutionalized	28,623	(7.5)	75,364	(21.7)	103,987
Lived alone/nonrelatives	73,884	(19.5)	110,960	(31.9)	184,845
Lived with 1 relative	192,498	(50.7)	91,330	(26.2)	283,828
Lived with ≥2 relatives	84,408	(22.2)	70,421	(20.2)	154,829
Assets at death					
Total	312,169	(100.0)	301,720	(100.0)	613,890
None	46,964	(15.0)	70,003	(23.2)	116,966
≤$4,999	48,594	(15.6)	71,146	(23.6)	119,740
$5,000–$24,999	53,405	(17.1)	47,193	(15.6)	100,598
$25,000–$49,999	53,915	(17.3)	40,116	(13.3)	94,031
≥$50,000	109,291	(35.1)	73,263	(24.3)	182,554

*Oregon was not included in the 1986 National Mortality Followback Survey.
†Numbers may not add to totals because of rounding.
§The total may vary because of missing data.

Mortality Survey — Continued

is the fifth mortality followback survey conducted by NCHS; the previous four, conducted in the 1960s, were less comprehensive than the 1986 survey.

At least two caveats apply to interpretation of the 1986 NMFS data. First, because these data are national estimates based on a sample survey, they are subject to respondent and sampling errors. Second, although 82% of the respondents who completed the NMFS questionnaire were close relatives (e.g., spouse, parent, sibling, or adult child) of the decedent, insufficient recall or knowledge about details of the decedent's life may have reduced the accuracy of the replies to certain questions.

The finding that women were more likely to be in "poor health," living without family support, or with fewer financial resources reflects in part the differences in age and marital status at death among persons dying from heart disease. Approximately

TABLE 2. Selected measures of health characteristics of persons who died from diseases of the heart, by sex — United States,* 1986

Characteristic	Men		Women		Total†	
	No.§	(%)	No.§	(%)	No.	(%)
Other diseases/conditions						
High blood pressure	188,040	(50.6)	201,088	(58.3)	389,128	(54.3)
Stroke	90,924	(24.0)	107,596	(30.5)	198,520	(27.1)
Angina pectoris	83,436	(23.6)	73,560	(22.4)	156,997	(23.0)
Diabetes	74,019	(19.4)	82,141	(22.9)	156,160	(21.1)
Cancer	23,850	(6.8)	29,605	(8.8)	53,455	(7.8)
Asthma	21,793	(5.7)	22,427	(6.3)	44,220	(6.0)
Other lung conditions	77,953	(20.6)	43,585	(12.3)	121,538	(16.6)
Help received with						
Activities of daily living	92,589	(26.9)	119,155	(44.7)	211,744	(34.7)
Home medical care	114,469	(33.3)	119,193	(44.9)	233,662	(38.4)
Overnight facility use						
Hospital/Nursing home	270,910	(69.4)	293,784	(80.8)	564,694	(74.9)
Other health facility	7,104	(1.9)	11,050	(3.1)	18,154	(2.4)
Home hospice	14,735	(3.9)	16,242	(4.6)	30,977	(4.2)
Major health payment source						
Total	312,438	(100.0)	296,489	(100.0)	608,927	(100.0)
Self/Family	36,495	(11.7)	42,411	(14.3)	78,906	(13.0)
Other family	1,798¶	(0.6)	3,542	(1.2)	5,341	(0.9)
Medicare	151,585	(48.5)	157,208	(53.0)	308,793	(50.7)
Medicaid	18,722	(6.0)	36,214	(12.2)	54,935	(9.0)
Health maintenance organization	71,023	(22.7)	41,386	(14.0)	112,409	(18.5)
Other source	32,814	(10.5)	15,729	(5.3)	48,543	(8.0)
Personal expenditure for health care						
Total	318,984	(100.0)	297,828	(100.0)	616,813	(100.0)
<$500	146,293	(45.9)	125,521	(42.2)	271,814	(44.1)
$500–$999	54,509	(17.1)	40,455	(13.6)	94,963	(15.4)
$1000–$1999	40,109	(12.6)	32,243	(10.8)	72,352	(11.7)
$2000–$4999	43,705	(13.7)	47,313	(15.9)	91,018	(14.8)
≥$5000	34,368	(10.8)	52,297	(17.6)	86,665	(14.1)

*Oregon was not included in the 1986 National Mortality Followback Survey.
†The total may vary because of missing data.
§Numbers may not add to totals because of rounding.
¶Estimate is based on <30 cases.

Mortality Survey — Continued

70% of women (in contrast to <50% of men) were aged ≥75 years when they died; moreover, three times more women than men were widowed.

These findings can aid in addressing the health-care needs of those with chronic disease. Other NMFS survey data can be used in addressing other public health issues.

Reference

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